Aziel's Razor and Occam's Razor

A variable-completeness framework for model construction before parsimony

Aziel Eliab

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Status: Conceptual framework. Not yet independently validated.

Abstract

Occam's Razor is commonly invoked as a preference for simpler explanations, but its legitimate use is conditional: candidate explanations must first account for the relevant evidence, and other things must be sufficiently equal. In practice, parsimony is often applied prematurely, before the variable field has been adequately identified. This paper introduces Aziel's Razor, a proposed methodological rule requiring investigators to enumerate materially plausible and evidence-linked variables, preserve their provenance, test dependencies, and only then consolidate the model without material information loss. The proposal does not reject parsimony; it reorders it. Parsimony becomes the final compression step rather than the initial filter. The paper defines the framework, contrasts it with common formulations of Occam's Razor, presents an operational workflow, specifies failure modes and stopping rules, and proposes empirical tests for whether variable-first consolidation improves explanatory adequacy in complex, cross-disciplinary, or poorly bounded problems.

Keywords: parsimony, model selection, variable completeness, premature closure, complex systems, epistemology, methodology

1. Introduction

Occam's Razor is one of the most frequently cited principles of reasoning and one of the most frequently oversimplified. Modern formulations generally treat simplicity or ontological parsimony as a theoretical virtue, often summarized as a preference not to multiply entities beyond necessity. Philosophical treatments emphasize an important qualifier: simpler theories are preferred only when other relevant considerations are equal. The principle is therefore not a command to choose the easiest story, nor a license to discard inconvenient observations.

The practical weakness addressed here is temporal rather than logical. Investigators often simplify before they have mapped the problem. In complex systems, historical reconstruction, interdisciplinary inquiry, and sparse-evidence environments, the apparent simplicity of a model may be produced by omission rather than insight. Aziel's Razor is proposed as a sequencing rule: first establish a defensible variable field; then simplify.

2. Historical and Conceptual Background

William of Ockham was a late thirteenth- and fourteenth-century philosopher. The familiar maxim 'entities are not to be multiplied beyond necessity' is associated with his commitment to ontological economy, although the exact modern slogan is not found verbatim in his surviving texts. Contemporary philosophy of science often interprets the Razor as a defeasible principle of theory choice rather than a truth-producing law.

This distinction matters. Parsimony can improve tractability, reduce overfitting, and constrain speculative ontology. Yet simplicity is model-relative. A model is not genuinely economical if its apparent economy depends on excluding variables that materially affect outcomes.

3. Definition of Aziel's Razor

Formal working definition. No materially plausible, evidence-linked variable should be discarded merely because it complicates the explanation. Investigators should map candidate variables,

preserve provenance, test relevance and dependency, and then consolidate to the smallest model that retains the observed structure and declared uncertainty.

- Variable-first: candidate variables are collected before compression.
- Evidence-linked: imaginative possibilities alone do not qualify; each variable requires an observational, theoretical, or comparative basis.
- Provenance-preserving: the origin, transformation, and exclusion rationale for each variable remain auditable.
- Dependency-aware: interactions, confounders, mediators, and boundary conditions are evaluated before removal.
- Loss-conscious consolidation: simplification is permitted only when it does not erase material explanatory or predictive structure.
- Uncertainty-retaining: unresolved variables are labeled rather than silently converted into absence.

4. Comparison with Occam's Razor

Dimension	Occam-style parsimony	Aziel-style variable completeness
Primary question	Which adequate explanation uses fewer unsupported commitments?	Have the materially plausible variables been identified and tested before compression?
Order of operations	Compare and simplify candidate explanations.	Map, preserve, test, then consolidate.
Main strength	Economy, tractability, resistance to unnecessary entities.	Resistance to premature closure and hidden-variable loss.
Main risk	Oversimplification when adequacy is assumed too early.	Combinatorial expansion and analysis paralysis.
Stopping rule	No added complexity without explanatory need.	No retained variable without material plausibility, evidence linkage, or measurable effect.
Best use	Well-bounded model comparison with equivalent fit.	Complex, cross-disciplinary, weakly bounded, or emerging problem spaces.
Relationship	Final preference among adequate models.	Precondition for determining which models are adequate.

5. Operational Protocol

1. Define the focal question, outcome variable, temporal boundary, and unit of analysis.
2. Create a variable ledger containing each candidate variable, source, evidence class, confidence, and proposed mechanism.
3. Separate observations from interpretations, hypotheses, assumptions, and external evidence.
4. Map direct effects, interactions, confounding relationships, temporal ordering, and possible feedback loops.
5. Test relevance using domain-appropriate methods: replication, sensitivity analysis, ablation, counterfactual comparison, or controlled observation.
6. Remove demonstrated redundancies and variables with no material effect within the declared boundary.

7. Consolidate the remaining structure into the simplest model that preserves fit, explanatory coverage, and uncertainty.
8. Publish exclusions, failed branches, alternative models, and criteria that would trigger revision.

6. Material Plausibility and the Boundary Problem

The phrase 'all variables' cannot literally include every conceivable influence. An unlimited variable space would be untestable and would defeat consolidation. Aziel's Razor therefore requires material plausibility. A candidate variable is materially plausible when at least one of the following applies:

- it is directly observed or measured;
- it is entailed by a credible mechanism;
- it appears repeatedly across independent sources or cases;
- its omission materially changes model outputs in sensitivity testing;
- it is a known confounder, mediator, boundary condition, or failure mode;
- a rival explanation depends on it and can state a falsifiable consequence.

Variables failing these tests may be archived as speculative possibilities, but they should not receive equal weight in the active model.

7. Failure Modes and Safeguards

Failure mode	Description	Safeguard
Variable maximalism	Every imaginable factor is retained.	Require evidence linkage and a declared mechanism or measurable sensitivity.
Narrative accumulation	More detail is mistaken for more truth.	Score explanatory contribution independently of narrative richness.
Post hoc fitting	Variables are added only after outcomes are known.	Pre-register variable classes and preserve timestamps.
Double counting	Correlated indicators are treated as independent evidence.	Map covariance and common-source dependencies.
Identity capture	Criticism of a claim is treated as criticism of the investigator.	Review claims as modular units with explicit falsification criteria.
Compression aversion	No variable is ever removed.	Use ablation and minimum-description comparisons after the mapping stage.

8. Testable Propositions

- P1: In poorly bounded problems, variable-first models will initially be larger but will exhibit fewer omitted-variable failures under external review.
- P2: After consolidation, Aziel-style models will retain more predictive stability under distribution shift than models simplified before variable mapping.
- P3: Provenance-preserving exclusion logs will improve reproducibility and reduce repeated debate over previously rejected variables.
- P4: The benefit will decrease as problem boundaries become mature, standardized, and well measured.

- P5: Without stopping rules, the framework will increase time cost and overfitting risk; disciplined consolidation is therefore essential.

9. Proposed Evaluation Design

A comparative study could assign independent teams the same complex case set. One group would use conventional parsimonious model selection from an initial candidate set; a second would use the variable-first protocol. Outcomes would include predictive accuracy, calibration, number of externally identified omissions, model size before and after consolidation, replication success, time cost, and robustness under changed conditions. Reviewers should be blinded to framework identity where feasible.

10. Discussion

Aziel's Razor does not claim that complexity is inherently superior. It claims that justified simplification depends on prior exposure to the relevant complexity. Occam's Razor remains useful after candidate models have earned adequacy. The proposed contribution is therefore procedural: move parsimony from the front door of discovery to the final stage of consolidation.

The framework is particularly suited to research programs whose evidence is fragmented across disciplines, formats, time periods, or uncertain source quality. Its value should be judged by whether it produces more complete yet still compressible models, not by whether it preserves every initial intuition.

11. Limitations

- The framework is presently conceptual and has not been independently validated.
- Material plausibility remains partly judgment-dependent and may vary across disciplines.
- The method can impose substantial documentation and computational costs.
- Variable enumeration can still reflect investigator bias and source availability.
- No framework eliminates the need for domain expertise, controlled testing, and external criticism.

12. Conclusion

Occam's Razor is strongest when it trims excess from explanations that already account for the evidence. Aziel's Razor addresses the earlier stage: determining what must be accounted for. Its core instruction is simple: do not simplify before understanding what is being simplified. Map materially plausible variables, test their roles, preserve the audit trail, and then compress without erasing the structure that produced the result.

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